YUKON-CHARLEY RIVERS NATIONAL PRESERVE

CENTRAL ALASKA NETWORK

Vegetation Monitoring Program

Summary Trip Report: Kathul Mountain Mini-grid

15 July – 24 July, 2009

Photo 1: Kathul Mountain as seen from auxiliary point 31. Halfway down the ridge running directly toward the camera is point 13. Note obvious foliar damage from leaf minders (brownish-appearing willow leaves) that was widespread across interior Alaska in 2009.

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PURPOSE:

The purpose of this trip was to install and measure the remaining permanent vegetation plots in the Kathul Mountain minigrid that were not completed during the initial visit to the study area, which was curtailed early. This study area was first visited in 2007 and 12 of the 25 points were completed at that time. Our work in this set of plots follows the protocols developed by the Central Alaskan Network (CAKN) for long term vegetation monitoring (see Roland *et al*. 2005).

PERSONNEL:

Pete Del Zotto—Crew lead; plot and quadrat variable estimates; vascular plants collections and tentative field identifications; transect recorder

Haig Diradourain—transect reading; plot photography; tree and sapling measurement; tree coring.

Kara Thies—soil measurements; non-vascular identification and collections

ACCESS TO MINI-GRID AND CAMPING:

Access

The Kathul Mountain Mini-grid is adjacent to the Yukon River on the north bank, about mid-way between eagle and Circle on the Yukon River. Transportation to the field site involves two segments from Fairbanks: 1) A 3-3 ½ drive to the village of Circle and 2) a 3 hour boat ride to/from the base of Kathul Mountain where we establisahed our base camp, and hiked to sampling locations from this site.

The boat was transported from Fairbanks along with our competent boat operator, Jobe Chakuchin (our river guide). We departed Fairbanks at 9 am, made two stops on the way, and arrived in Circle at about 12:30 pm. The boat was loaded with gear and ready for departure at 1:20 pm. A one hour stop at Slaven's Cabin was made for the pick-up of a park employee. We arrived at Kathul Mountain at 5:45 pm.

Camping

Camp was made at the toe of the bluff immediately above the river. Finding tent sites was difficult here. The spring ice floes and floods leveled much of the riverside forest, leaving a tangled mess of downed trees and churned earth in most places. Tents were pitched about 150 meters upriver from point 4 on mossy ground in a spruce stand. The kitchen area was placed in a small clearing among the debris about 125 meters downstream. A well defined animal trail connected most of the distance between the two locations.

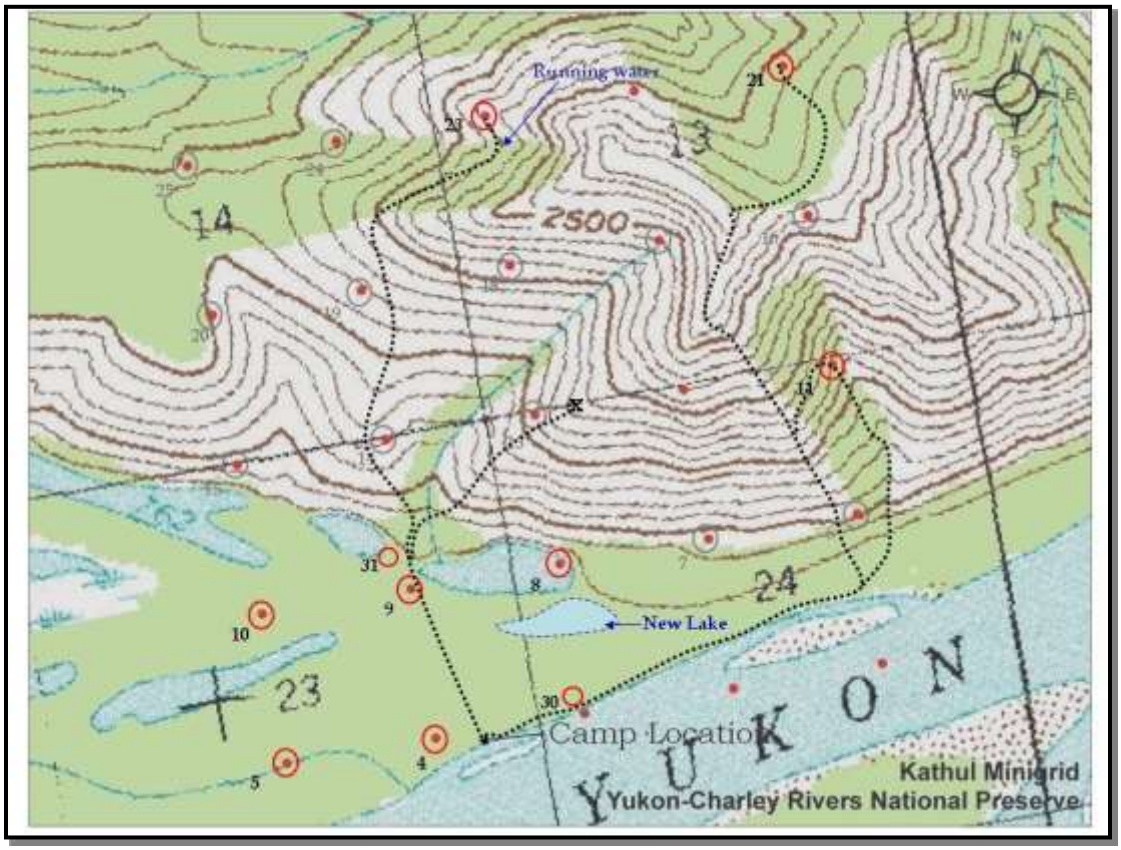
The river's edge makes the most sense for a campsite. Accessible water, mosquito-clearing breezes, and decent tent sites are among the reasons. The biggest disadvantage is the daily climb required to access most of the grid points, which is unavoidable.

Photo 2: The dinner table. Glacial silt was the dominant spice in meals prepared before the crew used this piece of Haig's handy-work.

All our water was brought on the boat and this turned out to be a great decision. The crew used 25 gallons of clean water during their stay. It's recommended this be done whenever camping along the Yukon when a clear-water stream is not immediately available.

HIKING:

Kathul Mountain is a formidable climb to reach the 15 or so points that lie on its slopes. Three ridges were used as travel routes; the two farther east each had ascents of several hundred feet on consistent 35-40 degree slopes. These slopes were occasionally broken by ledges and cliffs which weren't too difficult to navigate around. The grassy slopes often had the firmest, most secure footing. It's worth traveling these open slopes as opposed to those covered with dense, dwarfed aspen which impeded the progress of hikers. These steep hikes did provide relief from the hordes of lowland mosquitoes with a cooling steady breeze.



Map 1: The Kathul Mountain grid. Points completed in 2009 are circled red, those completed in 2007 circled gray. Points 30 and 31 are auxiliary points. Travel routes to the upper mountain are diagramed. "X" denotes turn-around point on day 8.

Hiking in the flats near the river has a few difficulties. The holes between hummocks often have water over-the-ankle. Drier walking often is available in stands of treesm, whereas open areas are wetter. There is also a "new" body of water between points 3 and 8. It is a shallow lake in the forest and forces a significant detour when traveling between these points. It possibly developed during this past spring's flooding and ice floes. It could also be evaporated by the next grid visit. Many trees in this lake have discolored, fading foliage.

WEATHER AND ENVIRONMENTAL CONDITIONS

In general the weather was comfortable with daily highs from the upper 60s to about 80 degrees. The flats below Kathul Mountain often had a combination of humidity and still air. Along with bug shirts and long sleeves to battle the hordes of mosquitoes this made for a sweaty day. The slopes of Kathul and the edge of the river often had a breeze. Forest fire smoke was noticeable and collected in the valley a few of the days. There was only one day with measurable rain.

SAFETY CONSIDERATIONS

The steep terrain and loose footing in this study area demands caution and attention to safety. This year a twisted ankle necessitated an early retreat to camp on day 8. Our

approach to climbing Kathul Mtn. was to keep a reasonable pace and to carry minimal weight. This meant pretty slow travel in trying to avoid exhaustion. On the days we climbed, pack weight was reduced in several ways. Some of the more significant methods included 1) leaving the tablet PC behind and recording all plot data on paper 2) removing measuring tapes were from their spools and rolling them "figure-8" style by hand and 3) Taking one GPS unit (Trimble).

Hydration can be an issue to to hot conditions in the open streppe environment on the south slopes of Kathul Mtn. There is no water on the south side of the mountain. However, a trickle of running water was crossed in the gulley near point 23 (Map 1). Since this was the driest July on record, odds are good that water runs there every year. The first bee sting of the season happened on along the trail between the kitchen and camping areas. It was likely a yellow jacket as the sting was painful and happened after a ground nest was disturbed.

PHENOLOGY OBSERVATIONS:

Most plant species were fruiting in this relatively low elevation area. Plants in the higher and fully-exposed sites seemed to all be producing fruit. The shaded, forested river terrace had more variation in the phenology. About 1/3 of the species on these points showed no sign of flower or fruit.

GENERAL NOTES ON PLOT-WORK AND PLOT OBSERVATIONS:

Eight of the 10 points remaining from the 2007 visit were completed this year, plus 2 auxiliary points. Regardless of location each plot had some time-consuming element whether it was a distant, steep ascent or a closer, but sapling-choked forest. Sapling tallies for points 10, 8, and 23 respectively were 140, 252, and 269.

Future crews note: there are two monument caps at point 11. Unknown to this year's crew, a cap had been placed there in 2007 although no field data was collected at the time. This year's crew completed point 11 and also installed a monument cap—the older one wasn't found until the work was almost completed there. It was left undisturbed until its presence was more clearly explained. The 2007 cap needs to be removed. It is 5.7 meters almost due south (about 15 cm east of the transect) of the 2009 point center. The 2009 cap is directly west 3.0 meters from a distinctive, 5 meter tall willow.

This area contained the greatest variety of flora of any grid visited in 2009. The exposed slopes of Kathul Mountain had numerous dry-site species that were observed nowhere else during the field season. Among these were *Zygadenus elegans, Bupleurum americanum, Erigeron compositus,* various *Artemisia, Eriogonum and Silene* species, also seen were *Calla palustris* (in the wet flatlands), *Maianthemum stellatum,* plus additional unidentified collections. There were points in both the dry-site, hillside, and river terrace locations that produced about 40 vascular species.

Photo 3: The correct plot center at point 11. It is directly uphill (west of) the willow in the photograph. A second center cap is in the plot and needs to be removed by a future crew.

Wildlife

No large animals were seen, only a couple of recent bear scat. This area had less evidence of wildlife than any other grid location in 2009.

Table 1: Collection series for the Kathul Mountain grid:

Collector	Type & amount	Series
Del Zotto	Vascular specimens (94)	PDZ 09-136 to -229
Diradourian	Digital Photos (195)	100-468 to 100-662
Diradourian	Tree Cores (39)	
Thies	Soils	11 samples
Thies	Nonvascular specimens (54)	KT 09-122 to -175

ACTIVITES:

Table 2: Synopsis of activities on the Kathul Mountain grid:

Date	Grid day	Activity
July 15	1	Drive Fairbanks to Circle; Boat to field site; establish camp
July 16	2	Complete point 10
July 17	3	Complete points 9 and 8
July 18	4	Complete point 23
July 19	5	Complete point 5
July 20	6	Complete point 11
July 21	7	Complete point 21
July 22	8	Complete points 4 & 30
July 23	9	Complete point 31
July 24	10	Boat to Circle; Drive to Fairbanks

Day 1: Wednesday, July 15 Travel
Crew departs Fairbanks 9 am with truck, boat and boat operator, arriving in Circle 12:30 pm. Begin boat ride on Yukon river at 1:20 pm. Hit gravel bar and bust prop. Limp into Slaven's roadhouse cabin 4:00 pm for scheduled pick-up of NPS employee. Arrive 5:45 pm at Kathul grid. Find suitable camping a few hundred meters upstream near point 4. Unload by 6:45 pm, and then establish camp.

Day 2: Thursday, July 16 Point 10
Hiked to point 10, being mindful to clear east end of lake. Travel among mossy hummocks was slow. Beyond the lake, a small bench in the forest provides quicker travel west to the plot. About 25 minutes from camp.

Point 10 is on a soggy flat, thick with small spruce and mosquitoes. It's likely an old river channel and with lots of alluvium. A few birch are in the area plus a mix of both black and white spruce. To the south the stand becomes increasingly dense (to >60% canopy cover) with more white spruce and birch, less black spruce. Return travel to camp about 30 minutes. Tussocks in the openings have water-filled holes—wet feet.

Weather: clear, high about 70.

Day 3: Friday, July 17 Points 9 & 8
Day started with phone call to relay work hours to Fairbanks timekeeper. Satellite phone had battery problems—spent time recharging battery. Travel to point 9 was flat with some hummocks and adjacent water holes., required only about 15 minutes

Point 9: This is on a slightly higher and drier spot than the surrounding terrain. It's a mix of spruce and birch with relatively large trees; some in the area exceed 20 meters tall. The Viereck type is a difficult call as overall crown cover here is ~60% and the spruce/birch mix is about 75%/25%. This open mixed forest runs in an E-W band and trees gradually diminish in size going north into slightly lower terrain this side of Kathul

Mountain. Ice not encountered during soil measurements and it is unknown if soil probe was indeed hitting permafrost.

Travel to point 8 was flat and a bit slow due to hummocks, about 15 minutes.

Point 8: This falls in a narrow band (about 30 meters width) of closed mix birch and spruce. About 20 meters north begins the toe slope of Kathul Mountain where the stand is pure birch. To the south the mixed stand becomes increasingly dwarfed and open. The area of the plot is less than 35 meters wide, and in terms of a Viereck polygon would likely be lumped with the birch stand to the north.

An unmapped body of water is encountered south of point 8 on return to camp. This forces a 150 meter detour to the west before heading south again to camp.

Weather: Clear with high around 70.

Photo 4: Two interesting observations on the south slope of Kathul Mountain include *Bupleurum americanum*, left and *Erigeron compositus*, right

Day 4: Saturday, July 18 Point 23

The plan was to complete point 23 after finishing some coring on point 9. From point 9 we climbed the hill to north, going near points 14 and 11, then contouring over to 23. This traverse is slowed by thick alder on the north side of the ride, stunted aspen on the south.

Plot 23: This southerly aspect is moderately steep (33 degrees) with primary cover being dwarfed aspen 3 to 5 meters tall. A few white spruce and paper birch are in the plot area. Leaf miner is affecting all the aspen here and also the others we've seen in the area. There is water in the gully 200 meters from point.

Weather: Overcast morning, drenching afternoon thunder shower. High in upper 60s.

Day 5: Sunday, July 19 Point 5

Point 5: This was reached by walking the river shore to the west and navigating to the point from due south. About 20 minutes from camp. This point is in a wet bottomland forest, 5 meters from a slough. The slough is 7 to 8 meters wide and about 1 meter deep. A few downed trees, possibly due to this spring's flood, are along the edge of this slough. The live trees in the plot are white spruce, but several cottonwood snags are nearby. This plot was time-consuming with 25+ collections (vascular and non-vascular), mapping and lots of wood and debris that slowed travel.

Weather: Morning smoke, afternoon clearing, high in the low 70s.

Day 6: Monday, July 20 Point 11

The plan was to complete point 11 and then start point 12. We hiked the river shore to the east then ascended the ridge immediately West of point 11. It's steep—the lower section has less secure footing than the upper part. We climbed to about the same elevation as the point, then contoured in (east). No big obstructions on the hike, just a constant 35-40 degrees. Hike time to plot 1:45-2 hours. GPS reception was difficult here as the terrain limited the view of the sky somewhat. About 30 minutes was needed to get a GPS signal good enough to navigate with even with PDOP setting of 20.

Point 11: This is a dry east exposure with some exposed rock and a small talus slope to the NW. Point center is a graminoid and forb dominated opening. A small finger of forest reaches the plot from the NE; one of the largest spruce on this hillside is at the edge of the plot. An aluminum cap monument was discovered as we neared the end of our work here. It was later discovered this cap was placed here in 2007, but no field measurements were taken. It should be removed in a future visit; see more details in the "Plot Observation" section above.

The descent to camp was made via the gulley to the east of point 11. It is not recommended. It's thick with shrubs, alder and rose. The ascent ridge, although steeper, is a better option.

Weather: Windy, steady E-W wind of 15 mph; high in the low 70s

Day 7: Tuesday, July 21 Point 21

This day's goal was completing point 21. The same ridge to access point 11 was used, but it was followed all the way to the top before turning north to one of the summits of Kathul. The saddle to east was descended, then a contouring done to the point. Travel time from camp, 3 hours, 45 minutes.

Point 21: This is in a stand of birch 6-8 meters tall with a few white spruce. There is a thin layer of soil densely covered with feather mosses over rocky terrain. It's easy to travel here and a pleasant location. Although there is fairly low plant cover here, the variety is impressive. No specific area has a high concentration of species; they're spread throughout the point. The birch cover here is very close to 60% so the plot and surrounding area could be considered a "closed" forest. Return to camp was 2 hours.

Weather: Clear and breezy, high 70.

Photo 5: View of point 8. Dominated by paper birch, this labor-intensive point required measuring 269 saplings.

Day 8: Wednesday, July 22 Points 4 & 30A

A less strenuous day working in the flats was scheduled today. Completing point 4, installing an auxiliary point near point 3 and completing the sapling tally at point 8 were the goals.

Point 4: This point was only about 60 meters north of our kitchen area. This area is black spruce woodland, but 15 meters to the south the tree canopy exceeds 25% creating a mixed spruce open forest (1A2E). Terrain is very flat with ankle deep feather moss and small hummocks. *Carex* is the dominant vascular understory plant. Until recently paper birch was a component here. A few snags up to 3 meters tall remain. To the north a few birch cling to life. There is evidence of silt on the tree boles above 2 meters—this area was deeply submerged in the April flood.

Point 3: This point falls in the Yukon River with point center at a distance of 10 meters from shore.

Auxiliary point 30: This was installed just north of point 3 in the tall spruce stand adjacent to the river. It's similar to point 4: a flat terrace, deep feather moss, a mix of black and white spruce, a prior component of *Betula neoalaskana*, and silt exceeding 2 meters on the tree boles. Two meters beyond southern plot boundary begins a flood debris zone (downed trees, rubble, etc) about a 5-6 meter wide band that parallels the river. North of the plot the forest gradually thins, trees decline in size and *Picea mariana*

becomes the dominant tree. This conifer band that contains point 30 has the tallest trees anywhere within ¼ mile of the river.

Weather: Windy, partly cloudy, high in upper 60s.

Day 9: Thursday, July 23 Point 31A

The day began with the goal of completing plot 12. Travel began on the prominent NE ridge on Kathul Mountain. At about 500 meters elevation a crew member slipped on a steep spot and twisted an ankle as it jammed into a tree bole just below. Walking was possible after this but was significantly slower. This event, plus the sooner-than-normal developing thunder clouds (Kathul Mountain is not a pleasant place during an electrical storm), forced a change of plans. The crew descended to the flats and installed an auxiliary point near point 9.

Auxiliary point 31: This was installed about 50 meters east of a small pond nearest to point 9. The pond is surrounded by about 2 hectares of graminoid dominated wet meadow in which the plot was established. It is practically a monoculture of *Calamagrostis canadensis* with less than a dozen other vascular plants surviving under the 1 ½ meter tall grass. There is no standing water on the plot but soil is saturated and some water surfaces under body weight at the north end. Dead grass is matted and often covered with a membrane of algae. A few birch are encroaching on the meadow from the edge but no further than the point. The willows that border the meadow are unhealthy with fading, discolored crowns. Several appear to have complete crown kill.

Day 10: Friday, July 24 Travel

The boat arrived at 8 am, was loaded and departed toward Circle by 8:15 am. A few landmarks were timed along the way from Kathul Mountain:

Charley River: 35 minutes
Slavens Cabin: 54 minutes
Thanksgiving Creek: 1 hour, 23 minutes
Circle: 2 hours, 35 minutes

The return drive included lunch in Central, and arrived in Fairbanks at 3:15 pm.

CONCLUSIONS AND FUTURE CONSIDERATIONS:

It is important to carefully plan the sequence of events during each day of sampling in order to maximize efficiency and spend more time sampling and less time accessing plots. Because of the difficulties in traversing some part of this study area due to thick, dense dwarf trees or alder shrubs, or else steep, loose slopes, carefully planning each days route and goals by examining the imagery and the two previous trip reports is crucial. The 2009 trip was a learning experience, and more could have been accomplished with some better route-planning: live and learn!

REFERENCES CITED:

Roland, C.A., Oakley, K., Debevec, E. & Loomis, P. (2005) Monitoring vegetation structure and composition at multiple spatial scales in the Central Alaska Network. National Park Service, Central Alaska Network, Final Monitoring Protocol.